

January 24, 2002

Refer to: HSA-10/B-94

Mr. Larry W. Brown, CE III
State of New York Department of Transportation
State Office Campus - Building 5, Room 410
1220 Washington Avenue
Albany, New York 12232-0751

Dear Mr. Brown:

In your letter dated December 18, 2001, you requested the Federal Highway Administration's (FHWA) acceptance of the New York State Department of Transportation's (NYSDOT) temporary concrete barrier with an I-beam connection as a National Cooperative Highway Research Program (NCHRP) Report 350 longitudinal barrier at test level 3 (TL-3). To support this request, you also submitted copies of a Texas Transportation Institute test report dated July 2001, entitled "NCHRP Report 350 Test 3-11 of the New York DOT Portable Concrete Barrier with I-Beam Connection (Retest)" and a videotape of the test that was run.

The NYSDOT temporary barrier is an 810-mm high New Jersey shape portable barrier made with 21 MPa concrete in segment lengths of 6.1 m. Its base width is 610 mm and it tapers to 150 mm at the top. Reinforcing consists primarily of four longitudinal 16M bars with three 13M stirrups located at each end of the barrier. Adjacent barrier segments are connected with steel "I" shaped pins (or "keys") which fit inside steel tubes cast into each end of the barrier segments. These tubes are 513-mm long and made from ASTM A500 Grade B or C steel. In cross section, they are 102 mm x 102 mm x 13 mm, with a 25-mm vertical slot cut into the exposed face of the tube at the end of each barrier segment. The connection key is made from three 13-mm thick steel plates welded into an "I" shape and has a steel cap that matches the upper shape of the concrete barrier when the key is in place. Barrier segments are connected by inserting the web of the connection key into the slots of the steel tubes cast into the ends of each segment. A detailed drawing of the design can be found on NYSDOT's web site at:

<http://www.dot.state.ny.us/caddinfo/design/stdsheets/standardpdf/m619-3rl.pdf>

Ten barrier segments were used in the test for a total installation length of 61.0 m. The impact point was 1.38 m upstream from the connection between segments 3 and 4 or approximately 20 m from the upstream end of the test installation. Under these impact conditions, both the dynamic and permanent deflections of the barrier were reported to be 1.27 m. Assuming that the barrier is not anchored at the ends, a similar impact nearer to either end would likely result in larger lateral deflections. The pickup truck was contained and redirected and all NCHRP Report 350 evaluation criteria were met. Occupant Impact Velocity was 5.6 m/s and ridedown acceleration was 8.9 g's. The reported pitch and roll angles were 51 and 19 degrees,

respectively. Performance of this barrier compares very favorably with previously accepted 6.1-m long temporary concrete barrier designs. It should be noted that the connection joints failed in an earlier test of this barrier as a result of improper weld length, size, and penetration. Thus it is critical that the fabrication details contained in your plans and specifications for this barrier be followed.

Based on the reported test results, we agree that the NYSDOT Temporary Concrete Barrier, when constructed as tested, meets the evaluation criteria for an NCHRP Report 350 test level 3 (TL-3) longitudinal barrier and may be used on the National Highway System (NHS) when such use is requested by a transportation agency.

Sincerely yours,

(original signed by Michael L. Halladay)

Michael L. Halladay
Acting Program Manager, Safety